

# Wisconsin Department of Transportation

## Truncated Warning Domes for Handicap Access Ramps

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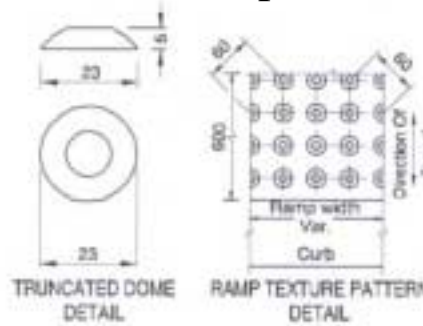
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## Truncated Warning Dome Systems for Handicap Access Ramps



Truncated warning domes provide a pedestrian detectable warning system for transition into traffic areas. The surface treatment is readily distinguished by the blind and visually impaired population. The domes provide a surface that is easily distinguished underfoot and by cane. The application's color contrast also provides cues to the visually impaired pedestrian.

The recent ADA Accessible Guideline (ADAAG) standards designate truncated domes as the only acceptable detectable warnings design for curb ramps. This will require all municipalities and states to install the truncated dome systems on all new handicap access curb ramps. This requirement was originally issued in the 1991 ADAAG guide lines. The requirement was temporarily suspended pending the completion of research studies. In July of 2001 the Access Board allowed the suspension to expire based on the findings of the completed studies. The expiration of the suspension reestablished the mandate to install these systems.

WisDOT has initiated study WI-02-03 in partnership with FHWA and the City of Madison. Product trials have begun in response to these new ADA guidelines. Products were installed in the Fall of 2002 and will be evaluated over the winter and following spring. Product trials are evaluating constructability, durability, aesthetics, cost, and conformance to the standard. WisDot has also entered into a partnership with the Minnesota Department of Transportation (MNDOT) in the evaluation of different proprietary systems. Wisconsin will share its product trials results with MNDOT and MNDOT will perform laboratory tests on the different products.

For more information and to view the complete rule visit <http://www.access-board.gov/1108> or <http://www.access-board.gov/>.

The following is a pictorial account of the installations of products during a recent and on going trials within the City of Madison.



# COTE-L

## 2 step



# COTE-L



A walk-behind grinder is used to prepare the sidewalk ramp



Surface prep work using the hand grinder as an option



Xylene is used for surface prep of area to assure bonding



Domes are provided in sheet form



# COTE-L



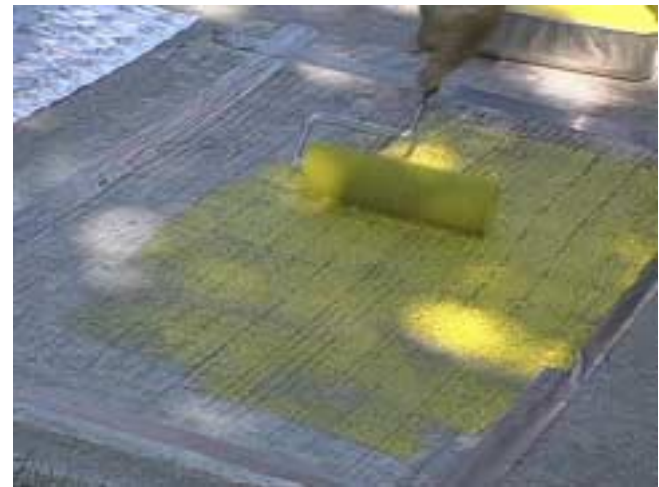
Outside perimeter is taped to provide defined working area



Accelerator is mixed into the Duriback material



A paint pan and a special roller are used to apply the adhesive/coating to the sidewalk/domes.



1<sup>st</sup> coat is applied for initial bonding of domes



# COTE-L



Domes are placed on the Duriback for bonding.



A flat board is used to apply pressure to seat the domes



The plastic is cut into 6-inch columns after initial setup. This allows the product to cure at a faster rate.



The plastic is peeled off after the product is cured. Pressure was applied to the domes in conjunction with removal of backing material.



# COTE-L



A second coat of Durabak-18 is applied after 3 hours of cure time.



Applying the third coat of the Durabak-18 the following day.



Finished Duraback (2step) by COTE-L



# COTE-L

## 1 Step



# COTE-L



The domes and field material are prefabricated into a sheet form.



Measuring from the curb flow line for correct placement



The outside edges are taped to mark outer edge of adhesive coverage.



# COTE-L



A caulk gun and trowel were used to apply the adhesive.



Troweling the adhesive for complete coverage.



Placing the mat.



Applying pressure with a flat board to assure good adhesion



# COTE-L



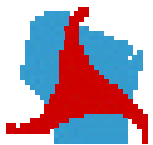
Using the board to firmly press edges and between domes for good adhesion.



Finished COTE-L Duriback mat



# Detectable Warning Systems



# Detectable Warning Systems



View of the flexible product, the backside is smooth.



Cleaning the surface with pressurized air after grinding.



Measuring and taping for correct placement.



Two-part epoxy adhesive is mixed.



# Detectable Warning Systems



Taped, measured and ready for adhesive.



Troweling on the two-part urethane adhesive.



Surface with epoxy ready for product



Laying the flexible mat down.



# Detectable Warning Systems



Rolling the mat down.



A piece of plywood and some weight to aid adhesion and left overnight.



A corner was trimmed to better conform with the retrofit installation site.



Drilling holes for the anchor pins the following day.



# Detectable Warning Systems



Mechanical anchor.



Edge sealer is applied.



Finished Installation



# Engineered Plastics

## Armor Tile

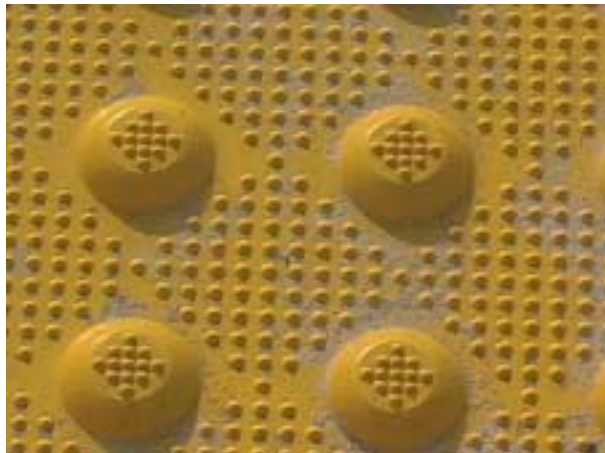
### cast in place application



# Armor Tile



Top side view of the Armor Tile product.



Close-up view of the Armor Tile surface pattern.



Holes in the ribs allow concrete to penetrate the ribs holding the tile in place. Vent holes at the top of each channel allow the air to escape in the installation process.



After conventional curb ramp preparation and finishing, the product is set in place.



# Armor Tile



Embedding the Armor Tile product.



Applying weight to hold the Armor Tile product in place during initial set (overnight).



Adjusting the depth of the Armor Tile product during final finishing.



# Armor Tile



Final edge finishing of the Armor Tile product.



Final finishing of the sidewalk ramp.



Finished installation



# Engineered Plastics Armor Tile retrofit application



# Armor Tile



Semi-rigid sheet.



Grinding of ramp areas for proper shape



Ramp site after grinding.



# Armor Tile



Blowing the concrete dust off with a gas powered blower.



Cleaning the ramp surface with Acetone.



Custom cutting the Armor Tile for a good fit.



Cleaning with acetone prior to applying adhesive.



# Armor Tile



Applying adhesive to underside of Armor Tile.



The product is set in place.



Cleaning edges of Armor Tile with Acetone prior to taping and caulking the edges.



# Armor Tile



Taping the edges of Armor Tile prior to caulking and sealing the edges.



Smoothing the caulk bead around the edges.



Installing the anchor pins.



View of the finished Armor Tile retro-fit product.



# Hanover Architectural Tiles

## precast application



# Hanover



An oiled form is inserted into fresh concrete to create the recess for the precast panel



Finishing the concrete around the form.



The form was removed the following day.



# Hanover



The finished cavity.



After 28 days of cure time the concrete is power washed to provide a clean bonding surface



A thin set mortar is applied for a bonding layer



Trowel in leveling mortar bed



# Hanover



Thin set material was applied to precast block.



The tiles were set, tape was applied to keep the edge clean



Joints were filled with thin set material.



Finished installation



# Increte stamp application



# Increte



Release agent being applied per the manufacturer's recommendation. It was later found that the best method was to apply to the stamp itself .



Tamping the mat to get the concrete to “rise” into the concave domes on the underside of the mat



After 1 minute of tamping the stamp is removed.



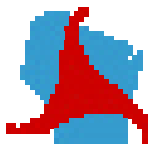
# Increte



Paint is applied for color contrast



Finished application



# Strongwall retrofit application



# Strongwall



Mineral spirits are used to clean the forms and to act as a release agent when the forms are pulled after the “mortar domes” have set.



The domes parent material is mixed.



After the area is ground and cleaned the forms are set in place.



Cementitious Material is applied to the forms with a flat trowel.



# Strongwall



Excess material is removed



The form is pulled after 6 hours of cure time in 50 degree weather.



Some of the domes were pulled off with the form.



# Strongwall



View of the product after the form was pulled. Notice that several domes did not adhere to the ramp.



# Strongwall



First coat of field material applied. Loose domes were reapplied with field material.



2<sup>nd</sup> coat of field material applied the following day. Temperatures in the low 50(f)'s.



Painting the application later that same day for required color contrast.



Finished Strongwall installation.

